PMSTPCOL PEmails

From: Ilka Berrios
Sent: Wednesday, April 30, 2008 10:02 AM
To: STPCOL
Subject: FW: RAIs 1, 2, 3, and 4
Attachments: ABR AE 08000034.pdf

From: Ilka Berrios
Sent: Wednesday, April 30, 2008 8:12 AM
To: wthomas@omicron.net
Cc: Jorge Hernandez; Dion, Jeanne
Subject: FW: RAIs 1, 2, 3, and 4

Willard,

Attached are the STP responses to the first four questions we asked STP. These are RAIs 1, 2, 3 and 4. Please review these and if possible please give feedback within the next month.

Thanks,

Ilka T. Berrios
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Division of Safety Systems & Risk Assessment
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Hearing Identifier: SouthTexas34Public_EX
Email Number: 44

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From: Ilka Berrios

Created By: Ilka.Berrios@nrc.gov

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"STPCOL" <STP.COL@nrc.gov>
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Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

April 28, 2008
ABR-AE-08000034
10 CFR 52

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Requests for Additional Information on STP 3 & 4 COLA

Attached are responses to NRC Request for Additional Information letter numbers 01, 02, 03, and 04 related to COLA Part 2, Tier 2, Section 3.4. This submittal includes responses to Question numbers 03.04.01-1, 03.04.01-2, 03.04.01-3, 03.04.01-4, and 03.04.01-5. When a change to the COLA is indicated by a question response, the change will be incorporated into the next routine revision of the COLA after NRC acceptance of the question response.

There are no new commitments in this letter.

If you have any questions, please contact me at (361) 972-4626.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 28, 2008

Greg Gibson
Manager, Regulatory Affairs
South Texas Project, Units 3 & 4

jwc

Attachments
1. Question 03.04.01-1
2. Question 03.04.01-2
3. Question 03.04.01-3
4. Question 03.04.01-4
5. Question 03.04.01-5

cc: w/o attachment except*
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Question 03.04.01-1

QUESTION:

The Ultimate Heat Sink (UHS) storage basin and the Reactor Service Water (RSW) pump house are located adjacent to each other (see Tier 2 FSAR Figures 1.2-33 and 1.2-34). There are electrical equipment and mechanical equipment rooms within the RSW pump house that are located below the RSW pumps and below the water level of the UHS storage basin. The basin wall separates the water inventory in the UHS basin from these rooms (see Tier 2 FSAR Figure 1.2-34, Section A) and includes penetrations through the mechanical room.

1) Identify the functions of the electrical and mechanical equipment described above.

2) If the equipment is safety-related, describe how the equipment is protected from the effects of internal flooding, consistent with the acceptance criteria in SRP 3.4.1, and add this information to the FSAR.

RESPONSE:

1. The electrical equipment and the mechanical equipment rooms within the RSW pump house are arranged on a divisional basis, similar to the RSW pumps on the upper elevation, and the Reactor Building Cooling Water (RCW) heat exchangers located in the Control Building. Safety-related electrical and mechanical equipment associated with the operation of the UHS and RSW pump house will then be placed in the corresponding division rooms.

   As shown on Tier 2 FSAR Figure 1.2-34, the electrical equipment rooms contain power centers that provide electric power to safety-related motor-operated valves in the RSW system located in the pump house and UHS, and HVAC equipment that cool the RSW equipment. Also located within the rooms are instrument panels associated with the monitoring and control of the RSW and UHS components, some of which perform safety-related functions. Safety-related leak detectors similar to those in the RCW heat exchanger rooms will be located in each of the division mechanical equipment rooms. Non-safety-related sumps and pumps are also located in these rooms. A fire protection water standpipe will be located adjacent to the stairs, with a hose reel on each elevation.

2. As described in Tier 2 FSAR Section 3.4.3.3, the RSW pump house is designed with the same internal flood protection features as other Seismic Category I structures. The design features of divisional rooms are such as to prevent flooding from effecting more than one

division: walls between divisions are fire-rated and substantial enough to withstand potential internal flood levels. Penetrations through these walls will use seals that are designed and rated to also withstand these flood levels. Access doors between divisions will be of the water-tight type. Tier 2 FSAR Section 9.2.15.2 also describes these features. Breaks in any of the moderate energy water lines will be detected by the leak detection sensors in the mechanical equipment rooms. These will sound alarms in the Control Room and stop the RSW pump and shut its isolation valves. Flood water intrusion will be limited to a single division.

No COLA revision is required as a result of this RAI response.

Question 03.04.01-2

QUESTION:

Advanced Boiling Water Reactor (ABWR) Design Control Document (DCD) Combined Operating License (COL) Item 3.4.3.3, "Flood Protection Requirements for Other Structures" states that the COL applicant will demonstrate, for the structures outside the scope of the ABWR Standard Plant, that they meet the requirements of General Design Criteria (GDC) 2 and the guidance of Regulatory Guide (RG) 1.102 (Subsection 3.4). STD DEP 1.2-1 refers to the relocation of the reactor internal pump (RIP) motor-generator sets and associated support components to a new building (Control Building Annex) adjacent to the Control Building. However, the South Texas Plant (STP) Final Safety Analysis Report (FSAR) Tier 2 Subsection 3.4.3.3 does not address flooding protection for the Control Building Annex. Please provide the required information per COL item 3.4.3.3. Include this information in the FSAR and provide a markup in your response.

RESPONSE:

The Control Building Annex is a nonsafety-related structure located adjacent to the Control Building. It houses the two reactor internal pump motor-generator sets, control panels, and the cooling water lines, HVAC system, and electrical lines that support the motor-generator sets. As described in DCD Tier 2 Section 9.5.10.3, the reactor internal pump motor-generator set equipment performs no safety-related function. Failure of the motor-generator set equipment does not compromise any safety-related system or component and does not prevent safe reactor shutdown. Therefore, the Control Building Annex is not required to be protected from the effects of internal flooding or external natural phenomena.

DCD Tier 2 Section 3.4 discusses the flood protection measures that are applicable to ABWR plant safety-related structures, systems, and components for both external flooding and postulated flooding from plant component failures. Since the Control Building Annex is a nonsafety-related building containing no safety-related systems or components, COL Item 3.4.3.3 is not being revised.

Question 03.04.01-3

QUESTION:

STD DEP 1.2-1 refers to the relocation of the reactor internal pump (RIP) motor-generator sets and associated support components to a new building (Control Building Annex) adjacent to the Control Building. Section 3 of the Departures Report indicates that STD DEP 1.2-1 has been evaluated and determined to comply with the requirements in 10 CFR 52, Appendix A, Section VIII.B.5. 10 CFR 52, App A, VIII.B.5 specifies that changes to Tier 2 information may be performed without prior NRC approval if the changes do not present an unreviewed safety question. Specifically, Paragraph B.5.b.1 specifies that an unreviewed safety question is present when the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the plant specific Design Control Document (DCD) may be increased. However, the staff could not locate supporting information that demonstrates how the plant design ensures that flooding sources originating in the Control Building Annex are prevented from affecting the availability of safety-related equipment housed in adjacent structures (e.g., Control Building, Reactor Building). Therefore, the staff is unable to conclude that the above requirement has been met. Provide a flooding analysis for the site-specific Control Building Annex addressing all acceptance criteria in Standard Review Plan (SRP) 3.4.1, Revision 3. As a minimum the response should address the following areas:

a) Identification of flooding sources within the Control Building Annex
b) Identification of equipment that requires protection from flooding in the Control Building Annex
c) Potential effects of flooding in adjacent structures due to a postulated break in the Control Building Annex

Include this information in the FSAR and provide a markup in your response.

RESPONSE:

a) Identification of flooding sources within the Control Building Annex

Not required. See response to Item c, below.

b) Identification of equipment that requires protection from flooding in the Control Building Annex

There is no equipment in the Control Building Annex that requires protection from internal or external flooding. As described in DCD Tier 2 Section 9.5.10.3, the reactor internal pump motor-generator set equipment performs no safety-related function. Failure of the motor-generator set equipment does not compromise any safety-related system or component and does not prevent safe reactor shutdown. All other equipment in the Control Building Annex is there solely to support operation of the reactor internal pump motor-generator set and therefore requires no protection from internal or external floods.

c) Potential effects of flooding in adjacent structures due to a postulated break in the Control Building Annex

The Control Building Annex has no personnel or equipment access paths to the Reactor Building. The Control Building Annex has one access path which is used for both personnel and equipment. This access path has a watertight door installed at the entrance to the Control Building designed to protect the Control Building from flood effects external to the Control Building. This includes protection from the effects of internal flood initiated within the Control Building Annex or the effect of external floods due to natural phenomena. Any penetrations between the Control Building and the Control Building Annex are either above any design basis flood levels or are designed to be watertight. This approach is consistent with FSAR Tier 2 Section 3.4.3.1 that addresses penetrations and doors that penetrate the exterior walls of Seismic Category I (safety-related) buildings. Therefore, flooding in the Control Building Annex won't have any affect on any safety-related buildings.

To clarify that the Control Building Annex is a nonsafety-related building and that it houses no safety-related systems or components the description contained in COLA Tier 2 FSAR Section 1.2.2.16.15 will be revised. The sentence is changed as shown below:

> The Control Building Annex is a nonsafety-related structure located adjacent to the Control Building. It houses the two nonsafety-related Reactor Internal Pump Motor Generator sets, control panels, and the cooling water lines, HVAC system, and electrical lines that support the MG sets. The reactor internal pump motor-generator set equipment performs no safety-related function.

Question 03.04.01-4

QUESTION:

STP DEP 9.2-5 describes modifications to the reactor service water (RSW) system, including increases in RSW flow rates and pipe sizes. Section 3 of the Departures Report indicates that this departure has been evaluated and determined to comply with the requirements of 10 CFR 52, Appendix A, Section VIII.B.5. However, the staff has not been able to find enough information to determine the acceptability of the applicant's evaluation per the requirements in 10 CFR 52, Appendix A, Section VIII.B.5. Specifically, the applicant did not address how the proposed capacity increase of the system affects the flooding analysis incorporated by reference in the STP FSAR. Please provide information to show how these flood-related considerations were addressed when evaluating this departure. Include this information in the FSAR and/or the departure report (as appropriate), and provide a markup in your response.

RESPONSE:

As a result of increased heat loads and site specific considerations (see STD DEP 9.2-1 and STP DEP 9.2-5), the RSW flow rate was increased from 1800 to 3290 m3/h. Due to this flow rate increase, the associated pipe line sizes were also increased to maintain the water velocity in the pipes. The size of the supply and return lines between the Ultimate Heat Sink (UHS) and the Control Building increased from 700A to 750A.

The water level signal in each of the Reactor Building Cooling Water (RCW) heat exchanger division rooms in the Control Building remains set at 1500mm to indicate flooding in that room. The RSW pump in that division is stopped, and the isolation valves in the RCW heat exchanger room, and at the RSW pump house are shut.

If the RCW heat exchanger isolation valve fails to shut and the water from the approximately 760 meters of RSW supply or return lines drain into the heat exchanger room, more water than anticipated in the DCD will drain into the heat exchanger room as a result of the increased pipe size and volume. As part of the 10 CFR 52, Appendix A, Section VIII.B.5 evaluation discussed in Departure STP DEP 9.2-5, the flooding analysis was re-visited. It was determined that the water elevation in the room will not exceed 5 meters, as stated in Tier 2 FSAR Section 9.2.15.2.4.

The other features of the room that prevent internal flood water from affecting more than one division, as described in Tier 2 FSAR Sections 3.4.1.1.2 and 9.2.15.1, are not influenced by the increase in RSW capacity.

No COLA revision is required as a result of this RAI response.

Question 03.04.01-5

QUESTION:

The following statements are unclear. Please clarify the following statements in FSAR Tier 2:

Subsection 3.4.1.1.1:

1) "…flood level arise accomplished"
2) "…exposure to water3.4.1.1.2, site-specific supplements."

Subsection 3.4.2: "…as well as ground and soild pressures, are calculated."

Revise the FSAR accordingly, and provide a markup in your response.

RESPONSE:

The following changes to the COLA text will be made in the next revision. The text that is changed from Revision 1 is highlighted with gray shading.

Subsection 3.4.1.1.1:

1) The first sentence will be corrected as shown below:

   Waterproofing of foundations and walls of Seismic Category I structures below ~~grade~~ flood level *~~arise~~ is accomplished principally by the use of water stops at expansion and construction joints.*

2) The last sentence was corrected to deleted the phrase "3.4.1.1.2, site-specific supplements" in COLA Revision 1, submitted to the NRC on January 31, 2008. The sentence now reads:

   In addition to water stops, waterproofing of the plant structures and penetrations that house safety-related systems and components is provided up to 8 cm above the ~~plant ground~~ flood *level to protect the external surfaces from exposure to water.*

Subsection 3.4.2:

This sentence was corrected to delete the "d" from the word "soil" in COLA Revision 1, submitted to the NRC on January 31, 2008. The sentence now reads:

> *Since the design flood elevation is ~~30.5 cm below~~* 414.5 cm above *the finished plant grade, ~~there is no dynamic force due to flood. The~~ the lateral hydrostatic* and hydrodynamic *pressure on the structures due to the design flood water level, as well as ground and soil pressures, are calculated.*